

APRIL 25, 1988

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CHEMICAL & ENGINEERING

NEWS

Foreign Investment

The increase in U.S. chemical industry continues

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CHEMICAL & ENGINEERING NEWS

APRIL 25, 1988

News of the Week

■ Occidental Petroleum pays \$2.2 billion for Cain Chemical, formed last year from the group of chemical commodities businesses that entrepreneur Gordon Cain and his investment banking group bought for about \$800 million. **Page 4**

■ Criminal charges for misconduct in research are brought against Stephen E. Breuning, a well-known researcher in drug therapy for mentally retarded children. **Page 5**

■ Senate 1989 budget resolution sets ceilings for research and development spending and approves funding for construction of Superconducting Supercollider. **Page 5**

■ Two important steps were taken last week toward achieving nuclear test limits—the U.S. flew first load of monitoring equipment to Soviet's major test site and Soviet scientists in Nevada prepared equipment to monitor underground chemical explosions in that state. **Page 6**

Cover: Hoechst Celanese chemical complex at Clear Lake, Tex.

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Business

Profits have been rising steadily at France's Rhône-Poulenc, thanks to strong global chemical business and success of corporate restructuring. **Page 13**

Dedication ceremonies last week for a Hydro Fertilizers plant in Immingham, England, were attended by Princess Anne. **Page 16**

Government

Foreign funding of U.S. university R&D is too minimal to warrant concern about foreign expropriation of domestic technology. **Page 18**

Science

Carl Marvel's extraordinary influence on chemistry is chronicled in files donated to history center. **Page 20**

New electron-transfer chain reaction in which a carbanion donates a hydrogen atom and transfers an electron has been discovered. **Page 22**

First editor of ACS's newest journal, *Chemistry of Materials*, will be Rensselaer chemistry professor Leonard Interrante. **Page 23**

Technology

Gas Research Institute takes new look at its R&D programs, puts more emphasis on applications and gas's competition with electricity. **Page 24**

Field test of underground gasification of unminable western coal shows technique is technically feasible, can be commercialized. **Page 25**

Books

"Organic Chemistry: The Name Game. Modern Coined Terms and Their Origins" by Alex Nickon and Ernest F. Silversmith shares exuberance for the words of chemistry and has fun with their origins. **Page 26**



News Focus

Foreign companies continue to invest heavily in the U.S. chemical industry to complement their global businesses, lured by cheaper dollar and large U.S. market. **Page 7**

Chemical & Engineering News

1155—16th St., N.W., Washington, D.C. 20036

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Published by
AMERICAN CHEMICAL SOCIETY
(202) 872-4600; TDD (202) 872-8733
John K. Crum, Executive Director

PUBLISHING BOARD: Ned D. Heindel (Chairman); Board of Directors Chairman: Ernest L. Eliel; President: Gordon L. Nelson; John H. Nelson, Louis D. Quin; Jeanne M. Shreeve; and Barbara G. Wood

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Subscription Rates 1988. Printed editions: nonmembers U.S. 1 yr. \$49, 2 yr. \$83, outside U.S. 1 yr. \$75, 2 yr. \$135. Air freight rates available on request. Rates above do not apply to nonmember subscribers in Japan, who must enter subscription orders with Maruzen Co. Ltd., 3-10 Nihonbashi 2-chome, Chuo-ku, Tokyo 103, Japan. Tel. (03) 272-7211. Single copies: Current \$7.00. Rates for back issues and volumes are available from Microforms & Back Issues Office, ACS, 1155—16th St., N.W., Washington, D.C. 20036. Back and current issues available on microfilm and microfiche. Rates on request from Microform Program, ACS.

Chemical & Engineering News (ISSN 0009-2347) is published weekly except for the last week in December by the American Chemical Society at 1155—16th St., N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to Chemical & Engineering News, Membership & Subscription Services, P.O. Box 3337, Columbus, Ohio 43210. ACS assumes no responsibility for the statements and opinions advanced by the contributors to its publications.

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LETTERS

Chemical weapons

SIR: One small sentence in a lengthy article on chemical weapons (C&EN, March 28, page 7): "The negotiators have yet to face this problem head-on." No one is clear as to whether 5000 or 10,000 persons have been killed recently in the Iran-Iraq war by use of chemical weapons. Can one say with any certainty that such weapons will not be used in a holier effort?

Negotiating is all very well, and I would hope that some progress were possible. Then I recall that the key players are supplying Iran and/or Iraq with chemical technology, long-range missiles, and a host of other devices to win the war. Did even one of the key players do more than condemn the recent Iraqi chemical attack? Yes, there is a very long way to go.

Harold B. Reisman
Weston, Conn.

Medical/medicine

SIR: Permit a retired physician to comment on Laurence J. White's letter (C&EN, Feb. 29, page 3) suggesting that we physicians could improve our public image if we were to belong to the American "Medicine" Association.

Our situation is exactly the opposite of yours, in that "medicine" as a common noun, used substantively or attributively, is the carrier of the poor image. Who wants medicine breath? Who could take seriously a medicine show? And I certainly would prefer to be called a medical man rather than a medicine man. Let White speak for his own profession.

F. Regis Riesenman
Arlington, Va.

Great Lakes cleanup

SIR: Your article, "The Great Lakes Cleanup Effort" (C&EN, Feb. 8, page 22) states that the use of fertilizers and phosphate detergents adds enormously to the amounts of phosphorus and nitrogen available to the lakes. This statement has never before been made in the published literature and is not correct.

Nationwide, the amount of phosphorus going into fertilizers is 29 times that which goes into detergents. The amount of phosphorus that runs off the farm in unused fertilizer and animal waste is 35 times that which runs into sewage treatment plants, before these plants, as do most around the Great Lakes, remove

the phosphorus. The 1981 Great Lakes Surveillance Report to the International Joint Commission found that, of the total phosphorus entering the Great Lakes, only 14% came from municipal discharges, and that is after phosphorus removal. In terms of total phosphorus flowing into the lakes, detergents contribute less than 1%.

A human being's daily body wastes contain twice the phosphorus that a normal washing machine puts out per day and per person. If detergents made an enormous contribution, human waste, which is not mentioned, would be twice as large.

Quite independently of all these numbers, the inconsequential contribution of detergent phosphorus is verified by published studies on the effect of detergent phosphate bans [Wisconsin Department of Natural Resources 1982, ditto 1988, Purdue University 1986 (after 11 years of Indiana ban), Wendt 1982, Clesceri 1982, ditto 1985, Runke (Minnesota) 1980, etc.], all of which show that detergent bans have no effect on water quality.

C&EN on Jan. 6, 1986, quoted a joint committee of the U.S. National Research Council and the Royal Society of Canada to the effect that the major success story of the phosphorus control programs was increased investments in municipal sewage-treatment plants. Your recent article is inconsistent with this by claiming that same success now includes "decreasing the amounts of phosphate allowed in detergents" (page 26).

E. A. Matzner
Monsanto Chemical Co., St. Louis

Forum for information

SIR: Alan C. Nixon (C&EN, March 7, page 4) is ambivalent about using the letters column for soapboxing—unless it's something he is interested in. Very human and very understandable. I find the letters column one of the most informative spots. I would like to inform readers he was writing about bill S. 465. My understanding is that this bill is to ban guns with less than 8.5 oz of steel in an effort to make them detectable. Some people have called this a ban on plastic guns. I know of no plastic gun or any plans to manufacture such.

The bill also seeks to empower the Secretary of the Treasury to ban all guns he deems not "readily detectable." Many small legal guns do not contain 8.5 oz of steel. If these were arbitrarily

Foreign Investment in U.S. Chemical Industry Continues Steady Climb

Foreign companies own about one fourth of the U.S. chemical industry, attracted here by cheaper dollar, huge U.S. market, fewer government regulations, and political stability

Marc S. Reisch, C&EN New York

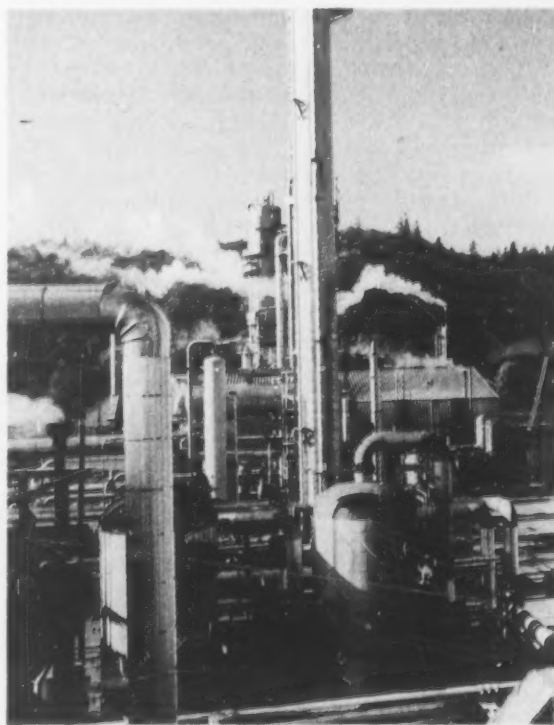
Cash-rich foreign companies continue to find U.S. industry a safe and profitable haven for investment. According to the most recent financial figures available from the U.S. government and other sources, in the past few years foreign companies have invested astoundingly high amounts of cash in the U.S. chemical industry as well as other businesses.

According to the Department of Commerce, in 1986, the most recent year for which figures are available, non-U.S. investors owned 23% of the U.S. chemical industry. That figure is based on the department's estimate of current cost net stock of fixed private capital in the chemicals and allied industries, and its report on the net book value of foreign companies' U.S. assets for those industries. For all industry, foreign investors owned 5.3% of U.S. assets.

Investment in the U.S. is apparently quite attractive. Using the Commerce figures, in 1985 foreign investors held about 20% of the U.S. chemical industry. For all industry, foreign owners held 4.9%. In 1983, the stake foreign owners held in the U.S. chemical industry was only 17%, and ownership in all industry was 4.0%.

It is in part the nature of the chemical industry to operate on a global basis because of the heavy investment required in fixed assets, as well as the research and scientific expertise required to operate a chemical enterprise. U.S. chemical companies themselves owned assets abroad comparable in value to foreign chemical interests in the U.S. The Department of Commerce reports that the value of those U.S.-owned chemical interests overseas amounted to \$23 billion in 1986, the same as foreign investment in the chemical industry in the U.S.

But the tide is turning as more chemical companies abroad invest in the U.S. According to James Greene, a New York City-based consultant, U.S. companies are following a pattern whereby they concentrate on one



Reichhold Chemicals, now owned by Dainippon Ink & Chemicals, operates alkyd resins plant in Azusa, Calif.

or two chemical lines and give their attention to nothing other than their highly targeted areas of expertise. Foreign companies are establishing beachheads in the U.S. to complement their worldwide businesses.

Greene, who formerly followed foreign investment activity for the Conference Board, the New York City business research group, says he would guess that U.S. chemical companies' investments abroad are on an order of about half of what came into the U.S. last

Recent highlights of foreign investment activity in U.S.

1987

Hoechst completes acquisition of Celanese Corp.
Dainippon Ink & Chemicals completes acquisition of Reichhold Chemicals
Mobay acquires Denka Chemical
Courtaulds purchases Porter Paints
Unilever acquires Chesebrough-Pond's, including Stauffer Chemical
ICI purchases Stauffer Chemical from Chesebrough-Pond's but retains only the agricultural chemicals business
Akzo acquires Stauffer specialty chemicals business

Rhône-Poulenc purchases Stauffer basic chemical segment
Henkel acquires former Diamond Shamrock's Process Chemicals Division from Occidental Petroleum
Montedison buys remainder of Hercules interest in Himont

1986

Air Liquide acquires Big Three Industries
BASF acquires American Enka
ICI purchases Glidden Paint
Rhône-Poulenc acquires Union Carbide's Agricultural Chemicals Division
Sandoz buys Velsicol's agrochemical business

Dainippon Ink & Chemicals buys Sun Chemical's graphics ink unit

1985

American Hoechst buys Hercules' interest in Hercofina
Henkel Corp. buys 25% of Loctite's stock
ICI buys Beatrice specialty chemical operations
Kemira acquires American Cyanamid's Titanium Dioxide Division
BASF acquires Celanese Carbon Fibers Division
BASF acquires Inmont
Ciba Geigy acquires Du Pont's pigments business

year. Still, says the consultant, who now publishes his research in a new business publication, *Northeast International Business*, a number of U.S. companies continue to expand abroad.

Examples of U.S. chemical producer investments abroad in 1987 include Arco Chemical's joint venture in South Korea with Yukong Ltd. to produce propylene oxide and styrene and another one in Indonesia with Germa Supra Abadi to make polyether polyols. Arco completed its acquisition of Atochem's polyols manufacturing facilities in Belgium, and started a joint venture with EniChem in Italy to produce resins. Du Pont signed a joint venture with DSM to make and market ethylene copolymers. FMC acquired the sodium sulfate business of Union Salinas de España in

Spain, and formed a hydrogen peroxide joint venture in Thailand with Indo-Thai Synthetics.

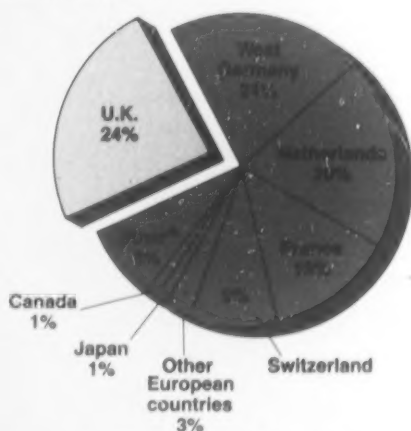
But the size of these American investments abroad last year pales in comparison with foreign-based concerns' huge investments in broad-based U.S. chemical operations for 1987. Among the larger investments in 1987 were purchase of Celanese by West Germany's Hoechst for \$2.8 billion and purchase of Stauffer Chemical by Britain's ICI for \$1.69 billion and its subsequent sale of two Stauffer divisions—the specialty chemicals business to Netherlands-based Akzo for \$625 million and the basic chemical assets to Rhône-Poulenc, the giant French state-owned chemical company. Italian chemical giant Montedison purchased Hercules' share in the U.S.-based polypropylene producer Himont for \$1.5 billion. Japan's Dainippon Ink & Chemicals completed its acquisition of Reichhold Chemicals for \$600 million.

The year earlier was not a slow year either for chemical investments in the U.S. Rhône-Poulenc purchased Union Carbide's agricultural chemical business for \$575 million. France's Air Liquide purchased Big Three Industries for \$1.05 billion, and ICI bought the Glidden U.S. paint operations for \$580 million.

Chem J. Listner, executive vice president of Findtech, the business brokerage subsidiary of Kline & Co., says that although there were more deals in which foreign companies took over U.S. chemical operations in 1986, the deals in 1987 were larger. He estimates 177 deals were completed in 1986 versus 142 in 1987, but he says that total value of those deals for 1986 and 1987 probably will be the same at \$15 billion to \$18 billion. The difference may indicate that large foreign players were seeking to buy more market share in 1987 than in 1986.

Industry observers believe that the large number of deals in 1986 resulted in part from the 1986 Tax Reform Act, which required taxing capital gains for the seller at ordinary tax rates beginning in 1987. Another incentive to close deals in 1986 was the tax act's repeal of a rule allowing the exchange of assets without any

U.K. is biggest foreign investor in U.S. chemicals



1986 total investment = \$22.99 billion^b

^a Asia, Africa, and Latin America. ^b Net book value plus net outstanding loans of foreign companies to U.S. affiliates. Source: Department of Commerce

tax consequences in certain acquisitions. But although the pace slowed in 1987, the value of all deals probably climbed last year, and that has been attributed variously to the rising specter of U.S. protectionism.

The threat of protectionism has been present for a number of years, but more recently it has come closer to reality. A trade bill now before Congress proposes to give the President authority to block foreign acquisitions of American companies if national security is believed to be threatened. In some versions, the bill also would require increased disclosure of foreign investments in American business and mandate that the U.S. retaliate against trading partners that are deemed to engage in unfair trading practices.

An analysis of the most recent government figures shows that, of all foreign investment, British-based companies collectively own the largest piece of the U.S. chemical industry, at almost 24% of the total \$23.0 billion in 1986. West German firms hold the next largest share, 21%; followed by the Netherlands, 20%; France, 13%; and Switzerland, 9.3%.

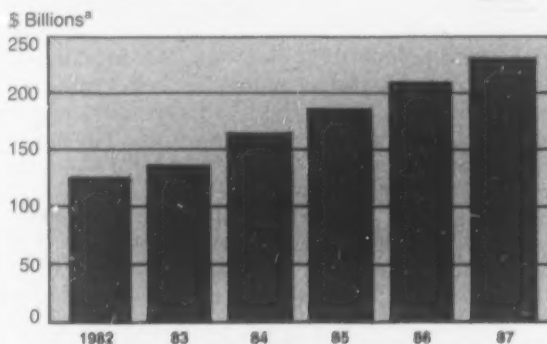
In explaining the interest of foreign investors in the U.S. and the subsequent growth of investment in this country, Alan Greenspan, chairman of the Federal Reserve Board, sees a fundamental change in the U.S. economy now under way. At a House-Senate Joint Economic Committee hearing in mid-March, Greenspan said that in the past U.S. businessmen "viewed our economy as being relatively self-contained. We thought of business cycles largely in terms of domestic spending, inventories, and production; foreign trade did not play a major role. Businesses saw their competition as being the firm down the road or in the next city or state, not the producer on the other side of the world."

More recently, Greenspan said, the U.S. economy has been driven "by external forces and is coming to resemble more nearly the open, trade-based economies of Europe than the insulated economy of our own past. We are increasingly affected by developments outside our borders."

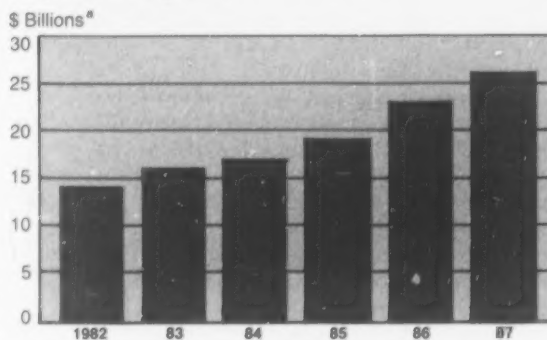
Greenspan's remarks are especially true of the chemical industry. Many major U.S. chemical producers have come to recognize that they must compete in a world economy, especially in commodity chemical lines for which there is a global demand. Commerce Department figures that show the balance of U.S. chemical industry investment abroad with foreign ownership in the U.S. chemical industry make it clear that most large U.S. producers share a global outlook of the chemical business. More significantly, the U.S. chemical industry has continually restructured itself for higher operating efficiencies and the industry as a whole has consistently shown a positive trade balance.

Given the U.S. presence abroad in the chemical industry, U.S. chemical industry executives should agree with Greenspan's open trade position. He told the Joint Economic Committee that foreign investment in the U.S. "is a highly desirable trend." From the Federal Reserve's perspective, he said that he was less concerned about the fact that more and more U.S. assets are being acquired by foreign investors than he

Foreign ownership of all U.S. industry has nearly doubled...



...as it has for chemical industry in past five years



^a Net book value plus net outstanding loans of foreign companies to U.S. affiliates.
Sources: Department of Commerce, C&EN estimates

would be if they were simply amassing U.S. dollars. Greenspan is concerned about maintaining a steady dollar relative to foreign currency, partly in an effort to allow U.S. products to compete more effectively in overseas markets to reduce U.S. debt.

W. Robert Clay, vice president of Du Pont's international department, says that, although foreign competitors in the chemical industry are pursuing a strategy to increase their share of the U.S. market, "we already have a substantial share here." Clay adds that Du Pont is investing in overseas markets in an effort "to get our market share worldwide to approach our share of the U.S. market." In 1987, more than 40% of Du Pont's chemical sales came from outside the U.S., says Clay. By the mid-1990s, the company expects to derive more than half its sales outside the U.S. "Sales in the U.S. are growing," says Clay, "but sales outside the U.S. are growing at a faster rate."

U.S. companies frequently complain about the constraints placed on their foreign operations by foreign governments. On the other hand, because they can often operate with a freer hand in the U.S., many foreign companies say they find the U.S. an attractive investment forum. Such problems as the repatriation of profits and the limits on ownership do not formally

exist in the U.S. In addition, the enormity of the U.S. market and the political stability of the U.S. are attractions to foreign investors.

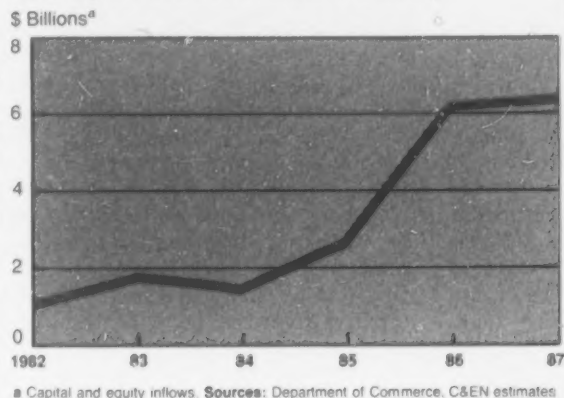
ICI, like Du Pont, believes the key to its future is in internationalizing its business. But unlike Du Pont, which could probably survive with its substantial and profitable U.S. businesses alone, ICI believes it could not in the U.K. ICI Americas chairman Harry Corless told C&EN in an interview last year when he received the International Palladium Medal of the American Section of the Société de Chimie Industrielle that ICI "couldn't survive by just concentrating its efforts on England," a country whose total economy is many times smaller than the U.S. economy.

ICI, like many international companies, believes it can invest for the long haul without concerning itself about the immediate profitability of its business. When ICI acquired Stauffer's agrochemical business, Ronnie Hampel, ICI's director responsible for American affairs, told C&EN, "We are under no illusions. The agrochemical business has been going through a difficult period. But there will always be a demand for food and the need to grow it more efficiently and well. Therefore there will be pressure on pesticide producers to provide safe and effective products."

Rhône-Poulenc president Jean-René Fourtou has expressed his interest in increasing the company's share of the U.S. chemical market. Like ICI's coup in agrochemicals, Rhône-Poulenc succeeded in springing ahead of competitors in world market share for certain organic commodities when it acquired the Stauffer basic chemicals business.

Many foreign investors are "willing to take their time to get a return on their investment," notes Grace Finley, the senior partner in Finley, McDermott & Co., an economic development consulting firm. "They're not necessarily looking for a return on a quarterly or an annual basis. Many view their acquisi-

Overseas buyers have invested heavily in U.S. chemical industry



tions in terms of a seven- to 10-year scenario for profit, especially the Japanese, who can wait." By contrast, U.S. companies are constantly emphasizing earnings per share in response to Wall Street's emphasis on profitability, she points out.

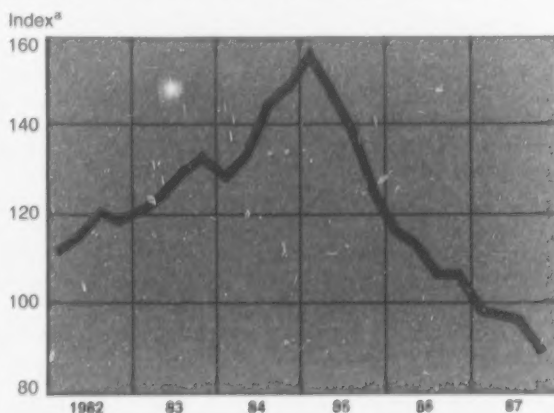
One executive who has chalked up experience operating under both the expectations placed on a U.S. publicly owned company and a foreign publicly owned concern is Ernest H. Drew, president and chief executive officer of Hoechst Celanese. He says that "Celanese executives hoped they reacted in the past for the long-term interest, but they still looked at the short-term return. Now that pressure is off. And now our managers don't have to worry about the short term as much as they did."

Industry observers also say that currently foreign companies can invest in the U.S. more easily because the dollar is relatively cheap. Even though a cheap dollar may help fuel U.S. exports and slow the flow of imports into the U.S., it also makes U.S. assets cheaper to buy. But that line of reasoning is only one element in a decision that a foreign manufacturer must make when setting strategy for buying U.S. assets.

In 1984 and 1985, when the U.S. dollar was at its strongest, according to Federal Reserve Board figures, foreign investment in U.S. industry in general and the chemical industry in particular did not decline, but increased. As the dollar declined in 1986 and 1987, the level of foreign investment increased.

Therefore foreign investment in the U.S. obviously derives from a strategic decision to invest in the U.S. market. The foreign currency angle is another element a foreign company may play to its advantage if it is patient. A foreign company that gained a foothold in the U.S. market with imports when the dollar was strong, can now shift emphasis to U.S. manufacturing. A foreign company can then consolidate its hold on a share of the U.S. market, and at the same time export products from its U.S. plants to supply home customers just as Japanese car makers, such as Honda, are doing. □

Dollar's ups and downs provide foreign investors bargain opportunities



^a Weighted average based on exchange value of the U.S. dollar against the currencies of Belgium, Canada, France, West Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, and the U.K. Source: Federal Reserve Board